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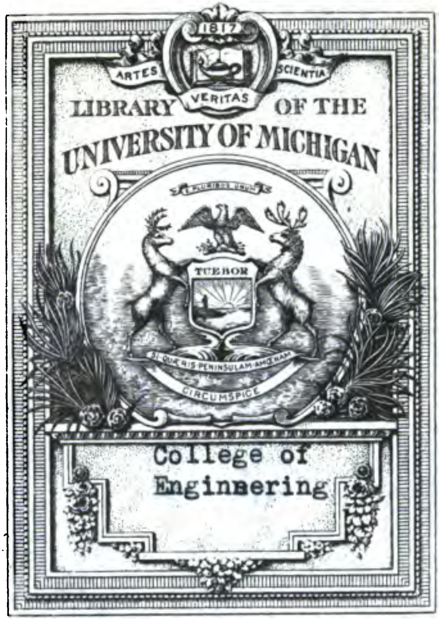

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PERSONAL

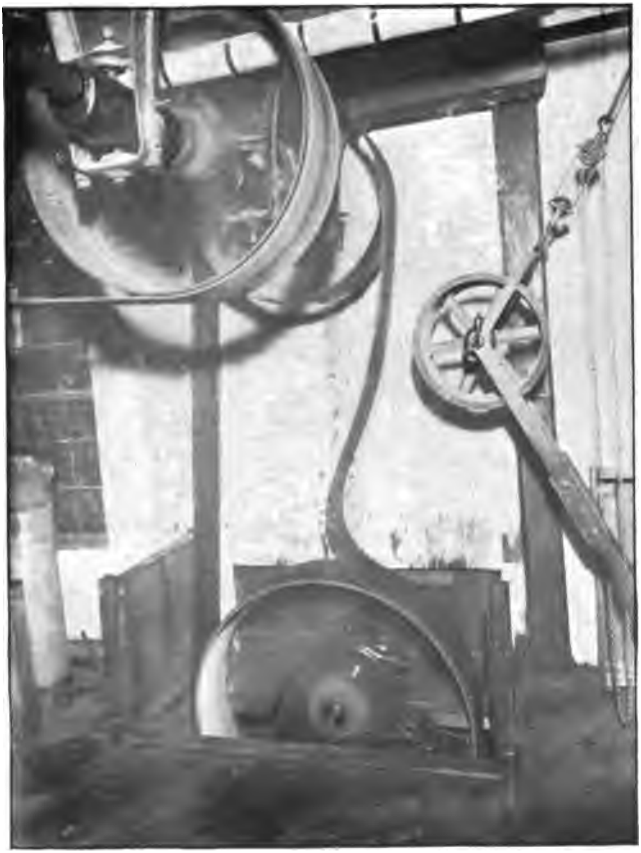
A maker, nowadays, knows all about his product, including the smallest details of its use, such as only his customers need to know. He tells them. He knows it all; or has to drop-out. The man, who knows and tells, gets the business.

You are a maker. If of something good, this is true of you. You are impatient with those, who use or need your product, when they abuse or refuse it.

Then, if you please, be glad to learn Cling-Surface from us.

It is a new subject, and ours. No man living knows it a quarter so well as we; and it makes the new knowledge on belt management necessary.

Cling-Surface Mfg Co

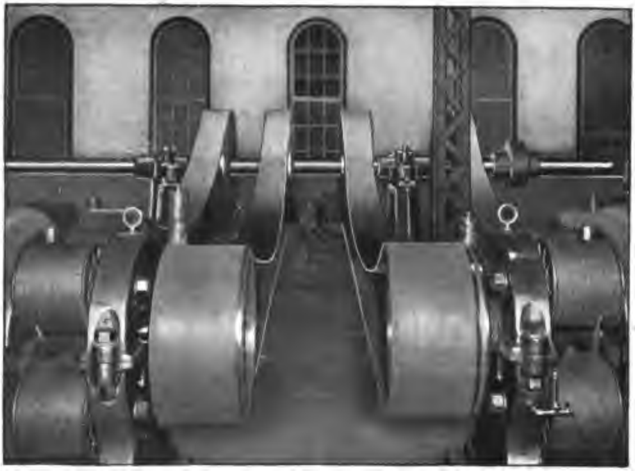


This belt is a freak; but we have a serious purpose in putting the picture on this conspicuous page—as a second frontispiece. Men can't believe what they see on next page, on pages 53 to 62; what they saw at the Electrical Exhibition of '99 in New York and Pan-American; what they see in thousands of works; what they read in this book, viz: a belt will work slack: it don't slip: the slacker it is, the tighter it clings.

This belt, when not in motion, hangs clear of the under pulley; the idler has to be used to start; but, when started, it works as you see! It is a pet of the mill-man.

But this dangerous-looking pet is traveling 1530 ft a minute, transmitting 55 hp, and is constant enough to make this photograph! What do you think of that!

But the owner is not yet sure of Cling-Surface, and objects to being quoted.



Carnegie Steel Co, Homestead, Pa, 12 Nov 1901.—I give below our experience with Cling-Surface.

In June 1900, we had the 12-inch belts on 7-80 Brush Arc machines stretched as far as the tightening slide would allow, at which point the belts would have to be shortened.

We were using a belt-dressing, but had to keep our belts so tight as to run the risk of hot bearings. We then began experimenting with Cling-Surface. Are now running the same belts with a sag to about 8 inches of tight side when loaded, giving maximum wrap on pulley and minimum pull on bearings.

We are well satisfied with the results.—S S Wales, Superintendent Electric Department.

UNIV. OF MICH.

Cling-Surface
and
Belt Management

By John E Powers M A

1902

CLING-SURFACE MFG CO
BUFFALO U S A

New York Boston Baltimore New Orleans London Tokio Johannesburg
Chicago Philadelphia St Louis Toronto Sydney Iquique &c

Langdon B Clark printer Buffalo

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Engineering Lib
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CLING-SURFACE

PART I

I THE NAME

It derives its name from causing the belt to cling to its pulley and pull: it gets a good hold on the pulley: don't slip. **Good name**

You can break your belt, if not very strong; you can't make it slip without straining beyond all reason.

II THE THING

It is stuffing; goes into the belt, and gives the whole belt the cling. The whole belt clings and lets-go—don't stick. Particulars, Chapters XI and XVIII. **Currying**

III GOOD FOR THE BELT

Good for the belt

It is good for the fibre of leather cotton and rope, and don't hurt rubber.

IV SLACK BELT

☞

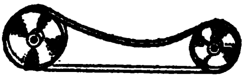
A belt delivers most power when slackest.

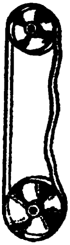
News to you

You think not; you have always found that slack belts slip; you can't believe that a very slack belt has a tight-enough grip for hard work.

True

It is true with Cling-Surface. You can drive a small grindstone or pull a 5,000- or 10,000-hp load, the whole power of the strongest belt you can get, with your belt like this.





and every user knows it

More power comes out of a slack belt than is practicable with a tight one.

Put-on Cling-Surface yourself, and see if it don't. All turns on whether a Cling-Surface belt slips; but follow Directions.

Nothing obscure about it

If you have no need of having particulars pointed-out, you may skip to Directions for Use; all the rest of the book is knowledge of belts, and the proof of it.

PART II

V THE GAIN

You save the strain and friction produced by tight belts all through your works.

Produced by tight belts

VI HOW MUCH

Depends on the number and tightness of belts in the train of your works: the greater the number and strain, the greater the loss. You save it all.

From a tenth to half of your total friction

VII GAIN IN POWER

If you belt two pulleys alternately tight and slack, and turn them by hand, you will see what the difference is.

Try it

Friction takes 5 to 70 per cent of the power of works

This difference may be 5 per cent of your whole power; more likely 10 or 15; perhaps 30; it may be 50. The sum of it differs in different works; but, whether it shows or not, it is always there. It is so much lost power.

Power is money

Power costs from $7.70 (Kent's M E's Pocket-Book, p 790) to $200 (Thurston's Friction and Lost Work, p 353) a year per hp.

VIII GAIN IN REPAIRS

Repairs are money

You save repairs in larger proportion than power: includes both tightening belts and repairs of machinery.

IX GAIN IN SHOP TIME

Waiting is money

The chief cost of repairs and of tightening belts is the loss of the use of machinery while you are on those thankless jobs.

X GAIN IN BELT TROUBLES

Belt troubles are money

All belt troubles are due to strain and slipping. Take-away both, and you have no more belt troubles. Friction troubles are almost all produced by tight belts.

Put-on Cling-Surface and take-off strain. The slipping stops, and the other belt troubles are done-with entirely: no belt troubles sure; no friction troubles almost sure.

a good deal of money

XI GAIN IN EFFECT ON THE BELT

It gives the surface of leather a velvety softness and smoothness, makes it all-through elastic and flexible, more like calfskin and less like wood, and not at all sticky—it lets-go of the pulley as easily as it takes-hold.

Health and strength of fibre

Its first and direct effect is to pull; but it has a slower effect on the body of leather or cotton or rope: gives it a certain springy softness and smoothness with great pliability. That makes it hug the pulley: gives it the hold, the grip, the pull; gives it health and strength and the pull.

Health and strength and pull

It has only a surface effect on rubber belting; good, so far as it goes, but less good than on leather or cotton or rope.

On rubber only the pull

XII GAIN IN WEAR OF BELTS

As good for a belt as oil for a journal

We don't know yet how long a belt will wear, when relieved of all stress but that of its work.

Stuffing and currying

Besides, Cling-Surface stuffs the leather or cotton or rope, and does for its internal fibres what oil does for journal and bearing: makes them slip smoothly and easily on one another, instead of grinding themselves.

Rubber is different

It does not penetrate rubber belting; but only this stuffing-effect is lacking in rubber.

XIII WATERPROOF

Not the cement

It makes leather cotton and rope entirely waterproof; not the cement, which fastens the pieces of leather together to form the belt. It protects the cement inside by keeping-out water, but not at exposed edges.

Cotton and rope

The only thoroughly waterproof belting is cotton and rope stuffed full of Cling-Surface.

XIV THE COST

A fiftieth part of its value

The cost is 35 c lb.

A belt will take-in perhaps five per cent, or more, of its weight till stuffed full. After that, a little occasionally.

Belts differ in make and condition. Poor leather takes-in more than good; cotton and rope more than leather; and a belt, already full of something else, takes in Cling-Surface slowly, and takes longer time to stuff.

Putting-on costs almost nothing.

XV THE RISK

We know the risk and take it

There isn't any risk. Whoever don't like it gets his money and freight back; whether we know him or not, whether we sold him or not, and whether he followed directions or not; right or wrong. We invite complaints and will have no enemies.

No bargaining necessary to get it

You are judge. We return your money if you consider Cling-Surface not successful in your works; but we know it ought to succeed, and will if used right.

So far, the briefest possible statement and argument.

PART III

XVI LESS INTERESTING

Know your work

Now we come to a lot of knowledge, that every owner and employee will be worth more money for having; but knowledge is apt to be dull. Will you read a little? and stop when you find it dull.

XVII INTELLIGENCE

There's money in it

A man does not know his work when his knowledge stops there; he must know a little all round it. That is ignorance; this is intelligence.

XVIII BELT LIFE AND HEALTH

The fibres slip along one another with Cling-Surface They saw one another without it

The care of belts requires some acquaintance with the nature and texture and action of leather.

Cling-Surface mellows the mass of it—cotton and rope the same—by giving the fibres, of which they are made, a surrounding cushion of lubricant: each particular smallest fibre, apart from the rest, is held in a sheath of solid lubricant.

Work and rest

This is the healthy condition for leather cotton or rope: the fibres ready to yield or pull. It does them good to be active; it does them good to rest. The life of a belt is to pull for an instant, cling to the pulley an instant, and rest on the slack for an instant; these three for ten hours a day, an hour at noon, a solid thirteen hours of sleep at night; and Cling-Surface keeps it going, nobody knows how long.*

Belt and heart

A slack belt works as your heart does. The working side of the belt is the beat; the slack return is the rest between beats.

need rest

The heart is enabled to work a whole lifetime by these short rests; the belt, with Cling-Surface, is resting half of the working day and all night. Tight belts have no respite. Belts need rest; it keeps them alive.

Nature provides for rest

No part of the human or animal body works all the time, as tight belts do.

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*We are asked continually: "Does Cling-Surface preserve the belt?" The answer is: Yes. It does more: it brings dead belts to life; restores elasticity; even improves a worn-out and otherwise hopeless rubber belt. We presume it trebles the life of belts.

Nature knows better than that.

XIX THE CLING

The whole mass of the belt takes hold

All depends on the cling; a belt can't pull without clinging; Cling-Surface gives it the cling. And this is the way to get the cling: by adapting the mass of the belt to hugging the pulley; not by putting some sticky stuff on outside.

XX WHAT THE CLING IS

Pulley and belt become almost one

It is so much friction between pulley and belt that the belt don't slip.

In journal and bearing, in gear, in slide, we want no friction; we want the easiest possible movement of part on part; we get it with oil. Between pulley and belt, we want the utmost possible friction, so much that no slip shall occur; we get it with Cling-Surface.

No slip

XXI TWO WAYS TO EASE MACHINERY

Oil and Cling-Surface

One way is by fitting the working parts with different oils, to keep them apart with their different pressures and speeds; the other way is to diminish the pressures—slack belts.

They go together; do both. Slack belts are as easy a subject as oil; and simpler. Oil problems are many, and some of them difficult. Every movement of metal on metal requires its oil; there are hundreds of oils; which one shall you use? And the question has to be answered separately for every journal and cogwheel and slide in your works.

work together

Hundreds of oils

There is only one Cling-Surface; it eases all belts, and no belt is eased without it. No exception. Words won't make the fact any plainer. There are minor degrees of ease. No belt is eased to the full without it.

One Cling-Surface

XXII SLACK OR EASY

The kind of work, or something else, determines how slack a belt can be run, with Cling-Surface, from easy to almost touching the working side. The rule is as slack as you can without mischief: more slack, more power.

How slack

It is not true that a slack belt is always pulling more than a tight one would in its place. It will, if called-on:

Possible misunderstanding

it won't slip. The tight one slips perhaps at half the load.

No hobby There is no use in making a hobby of slack belts. It is worth while, in some places, to run a belt so loose that the slack nearly touches the drive. The reason may be that you want the power; more likely to ease the journals involved. In other places, it is worth while to run a belt easy, not sag much, perhaps not at all. And the reason for this is: convenience: the power and journal friction are less important. You get exemption from belt-and-friction trouble with either slack or easy. Vertical belts, as a rule, should be easy, not slack.

Use judgment Where belts are run right, you will see some straight on both sides, when not working; some slack on both sides, when not working. The former are easy; the latter are slack; both sag a good deal when working full load, if they have much load. More sag, more power; except, of course, when the drive is above and the slack below.

XXIII CUSTOM

New

You are accustomed to oil and not to Cling-Surface. You know oil, and are not acquainted with Cling-Surface.

So is oil

Do you know oil? Of a dozen experienced men, how many will use the same oil on a journal or cylinder? Who can tell the best oil to use on a crank-pin? Oil is still a mystery, after some thousands of years.

New knowledge

Does the telephone pay? It was new a few years ago. Electric light and power and wireless telegraphy—new knowledge makes a new world and new business. How are you treating new knowledge? you. If you don't learn it, that don't kill it; it may kill you. Others are learning it, managing by it, getting ahead, and controlling business, your business. Quick men are getting the business of slow men.

XXIV HOW LEARN

Nothing is easier

All you've got to do, to make acquaintance with Cling-Surface, is: put it on a troublesome belt—but follow Directions. You'll see the effect in a minute. That effect will grow for a month or more in a light belt, for a year or more in a heavy one. The first minute confirms this book; the year only lengthens and strengthens the first experience.

XXV FOOD NOT MEDICINE

For all belts

Some use Cling-Surface for troublesome belts, and not for the rest. You might as well let a baby go without food till it cries.

Hunger is useful

The use of food, for a child, is not to keep it from crying; but to keep it comfortable and healthy and active and growing. The use of Cling-Surface, for belts, is not to keep them from crying; but to get full shop work at least expense.

For all belts

What is good for a troublesome belt is good for another of quieter temper. Belts are like people. Some of us wear our troubles outside, and some of us try to conceal them. We all have our troubles. No belt is easy without Cling-Surface, whether it tells you or not, whether you hear it or not.

Belt and friction troubles are kindly and fortunate signs of gross waste of money for coal, repairs, shop time, irregular work, and new plant or worse, getting-on with worn-out machinery; just as colic is sign of bad stomach-management.

Troubles are useful

All these losses, however, exist in less degree and make no sign. Economy searches them out, and intelligence finds them. Use Cling-Surface for all your belts.

For all belts

XXVI OVERLOADS

The weak part of your works is your belts; not the belts, but their slipping; unless you use Cling-Surface. Stop the slip, and your weak part is evened-up.

Weak part of works

What you want is a mill that will take the inevitable overloads of business as an all-round man takes his overloads—with a smile.

XXVII SCIENCE

What is the teaching of technical schools and books on the treatment of belts?

Authorities

Schools are the best authorities on new questions

The schools teach Cling-Surface; the knowledge hasn't got into books yet.* The source of new practical knowledge is, nowadays, workshop and laboratory. The schools take it up immediately; but books are several years behind. The great fact, that a slack belt delivers more power than a tight one, is not to be found in any technical book before this, so far as we know. The authors didn't know it, when they were writing the books.

Books are behind

Dates from 1896

We discovered and published it in 1896; the schools are in full possession of it; thousands of shops and mills and works, to which we have access, know it enough to treat their troublesome belts accordingly — some of them all their belts — but books take time: even Kent's M E's Pocket-Book, though lately revised, says nothing about it!

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* F W Taylor, in his celebrated paper, "Notes on Belts," read before the A S M E, at Germantown, 1893, related that one of his mills was belted: half by the usual standard, for a double belt to pull 65 lb per inch of width, at 5000 to 6000 ft a minute; the other half to pull 30 lb at 4000 to 4500 ft a minute. And then:

"85) It is safe to say that the belting of the first half of this mill (ordinary rule) gave 100 times as much trouble as that of the second

PART IV

XXVIII DETAILS

Particulars

Now you are ready for knowledge that would have been wasted on you in Part I. You have run through the subject; but some unexpected details have come from experience. These you are now in condition of mind to dwell-on a bit.

XXIX PRESENT CONDITION OF BELTS

Use judgment

What a belt requires, of course, depends in part on its kind and condition.

Four kinds

There are four kinds: leather cotton rubber and rope.

The leather is from middling to best, the rubber from good to worst, the cotton and rope vary less as to quality.

Many conditions

Leather belts in use have been "dressed" with nobody-knows-what-not, and nobody knows what the leather has suffered from them; cotton is painted or

---

half. In fact, the belting proved to be the chief source of trouble and expense in running the first half of the mill, owing to the frequent interruptions of manufacture caused by it; while that of the second half ran, from the start, with almost no trouble."

If half-tight belts make "almost no trouble," how much will slack and easy ones make?

The last words spoken, in the discussion that followed this reading, were these (by F W Taylor): "What we do not know about belting far exceeds our knowledge of the subject."

not; rubber is adulterated; and rope is generally no worse than foul.

One cure

Their condition is various. There is only one medicine for it; the variousness must be in their treatment.

XXX TREATMENT OF BELTS

I LEATHER

Belt clean to begin-with

Clean it, if foul, by washing and scraping. If very foul, this is necessary; if not very foul, it still facilitates treatment. The cleaner the belt to begin-with, the better. Easiest done when running at low speed.

Washing-mixture

To clean a belt. Wet it with three parts benzine or naphtha or gasoline and one part turpentine. Cuts the grease and loosens the dirt. Scrape it off, and wash with the mixture again. It dries in a few minutes.

In works, where you can't use this washing-mixture, use turpentine alone, or apply hot Cling-Surface twice; then scrape.

Two ways

There are two good ways to apply it on leather belting; some prefer one, and some the other.

First, with a stiff paint-brush. Have Cling-Surface hot, dip the brush, rub-off the excess on the side of the pot as a painter does with his paint, and brush either belt or pulley, whichever is handy; brush lightly at first to avoid getting-on too much. If on the belt, put it on near the pulley ahead, for the pulley to spread it while hot. **With brush**

The other way, with a long-spout teapot; and agate is better than tin (no solder to melt). Flatten the end of the spout, so that hot Cling-Surface will flow-out in drops. Drop it from side to side on the pulley or belt, whichever is handy; if on the belt, near the pulley ahead, for the pulley to spread it while hot. **With teapot**

No matter how you apply it; put-on very little and hot. **Little and hot**

The pulleys spread it over the belt, as a printer's ink-roller spreads his ink.

A high-speed belt will spread it in five minutes; a slow one takes more time.

In an hour or less (ten minutes with **Dries-in** high speed) the Cling-Surface has all gone into the leather. But this depends on how clean the belt was, and how little you put-on; the less the better.

When it has all gone into the leather, so that the belt is dry—it ought to be dry in an hour or less; depends on how little you used—apply it again in the same way. If you put-on little enough, you can apply it twice the first day.

Again

Apply it again the same way in a day or two; and at increasing intervals. Always wipe-off the dust beforehand.

How little

Always only a little. Put it on so that, when the pulleys are spreading it over the belt, it feels to the touch like a thin coat of molasses, and comes-off on the hand as that would; but dries-in in less than an hour. If it does not dry-in in an hour, you have put-on too much; and too much is troublesome.

First-rate example

One of our men, who has had about all the sick belts in our part of the world to treat and has never failed of complete success in a single instance, applies *extremely little* Cling-Surface at any one time, applies it *hot;* but uses whatever comes handy instead of the paint-brush or teapot—takes his handkerchief out of his pocket sometimes.

Why not learn by reading

A great many men go through the same experience with Cling-Surface. They won't believe that so little of it has to be used. A story illustrates it.

A story

An engineer put-on a lot of it all at once. The belt slipped; engineer, disgusted, wiped it all off; when lo! the belt pulled; and he found-out for himself that too much is worse than none.

Back of belt

You will gain much time and efficiency by putting Cling-Surface on the back of the belt frequently.

Go by the book

There are two sorts of directions for use: one full and explicit for careful men; the other short and easy for easy-going men. We give both. This book is to teach all we know on the subject. It is for careful men, who will keep it and study it. Short directions on packages. They have to be short.

Once a week

The best care of belts is a regular going over them once a week, applying *little enough at a time.* But most belts are not well cared-for. Once a month or two or even three is considered enough by the average man. It is not enough.

Full efficiency

When a belt is once stuffed full of Cling-Surface, it is in perfect condition, and needs very little to keep it so.

After the first application, the belt is continually improving. It arrives at its best when stuffed full.

Immediate

The effect of the first application is immediate; the effect wears-off, if not repeated soon. But, when the belt is stuffed full—it takes a month or more for a light one, a year or more for the heaviest—then the belt will take-in no more, except to make good the wear. You get the full effect of it then, and only then.

Use judgment

If the leather is good, it takes-in Cling-Surface slowly; if poor, it takes it in faster. Cling-Surface don't go-in of its own accord. The pulleys push it in; and the leather fibres work it in. Between the two, it penetrates four-ply belts and stuffs them full all through. It may take a year or more. The cement is a hindrance; but it gets through; and it don't affect the cement. If the leather is already full of something else, it crowds that out; and that takes time.

Oily belt

If a belt is run in a spatter of oil, sprinkle on it whiting or chalk, Fuller's earth or flour, any powder, and scrape-off. Repeat till dry; then wash with the cleaning-mixture, protect it from oil, and apply Cling-Surface.

All we know about leather

This Chapter applies to all leather belts in all conditions of belt and service.

2 COTTON

Simple

Unpainted Cotton.—Treat same as leather, but faster; not so much danger of getting it on too fast. Put it on all over, more on the front and less on the back, with the brush or tea-pot.

Mistake

Good belting

Unpainted Cotton is little used, because it shrinks and stretches with every change of air as to moisture. Rubber belting is mostly used for damp exposures. Cotton belting, stuffed full of Cling-Surface, is as good as the best of rubber, costs much less, and is far more waterproof. You can soak it in water a year without getting it wet inside.

The paint a hindrance

Painted Cotton.—More like leather. Wet the working side of the belt with turpentine or benzine, to loosen the paint; scrape-off, and apply Cling-Surface. The paint on the working side of the belt is a hindrance.

Camel's-hair

Camel's-hair, if unpainted, same as unpainted cotton. If painted, same as painted cotton.

3 ROPE

Good belt

Same as unpainted cotton. Apply with brush or teapot to the rope as it passes over the pulley—then the grooves catch any excess and help distribute it.

4 RUBBER

☞ Don't use the washing-mixture on rubber. It would cut it.

Cling-Surface on rubber belting is different: Nearly its full effect is got with the first application or two, because it don't penetrate.

Use extremely little, therefore; less than on leather; and still less on cheap rubber.

Most important

The reasons for using so little on good rubber belting are: (1) it is enough; (2) excess produces slipping.

Reasons

There is additional reason for using almost as little as possible on cheap rubber. Unless most sparingly used, it probably tends to disintegrate some of the mixtures of rubber.

Cheap rubber

There are all grades of rubber belting from good to extremely poor; the latter contains but little pure rubber; such rubber is not very strong; the working layer gets pulled-off in patches and strips. The belt will be improved by pulling it all off, leaving the cotton bare against the pulleys: a rubber belt with a cotton working side. Then Cling-Surface makes an almost good belt of it.

Grades of rubber

There are also old rubber belts in all stages of wear and demoralization. Cling-Surface, applied to most of them, stops their slipping; and then the worst of them break. Cling-Surface has "ruined" them.

The worst

Next-worst

Take the next grade better. Cling-Surface forces the belt to do more work than its working layer of "rubber" can stand; and so it tears-off in patches and strips. No harm done. When a belt begins to go in this way, scrape it all off, and apply Cling-Surface on the cotton.

No harm done

Cling-Surface is thought, by some, to destroy such belts. Mistake. If it only pulls-off their working layer of worn-out rubber, there's no harm done; the belts are better without it.

Good for all but the worst

Cling-Surface is getting good work out of thousands of cheap rubber belts; but it breaks the worst of them, if overloaded.

Overworks the worst

We'd rather not sell it for those that give-out when their slipping is stopped, because you complain when they break; but we can't draw the line; nor can you. If you overload a poor or worn-out belt, and compel it to carry the load, it will give-out; or, rather, it may. It is the belt that fails; and it fails because Cling-Surface don't fail.

Directions for rubber

The best way to apply Cling-Surface to rubber belting appears to be: Dip lightly a piece of folded cloth (not waste) in Cling-Surface hot, and press it gradually against the pulley or belt at one edge for a few revolutions. This treats a strip of the belt. Same way for the next strip; and so across the belt. Pressing it gradually avoids excess in spots.

Anyhow if little enough

You can apply it on rubber belts with a paint-brush, by brushing the paint-brush almost dry on the top of the pot; if you drop it out of a teapot, you are likely to get-on too much.

PART V

XXXI REFERENCES

How it works

After all, there's nothing like experience.

Postage stamp

But, if you ask these people to write you, enclose a stamp. A letter, such as you want, may cost a dollar or two; but nobody wants the money; enclose a stamp for civility.

XXXII CLING-SURFACE TALES

Apology

Some were told, some written; we cut-short and print only those that contribute to knowledge; mere recommendation is of no account; small type to get more in.

Our fault

They are what men have said; they don't always say the main thing, nor what you are looking-for. We are ashamed of the fact that most of them use Cling-Surface only for troublesome belts and main belts; it is our fault; we haven't compelled them to know better.

XXXIII THE TALES

Dead belt worth $320 a year

Erie RR Union Dry Dock Co, Buffalo, had, 6½ years ago, an old belt, that had been stretched dead; it was as tight as a fiddle-string, slipped a good deal, but furnished almost power enough for its duty.

Put-on Cling-Surface, slackened the old belt, by inserting a piece, and had power enough for additional load that would have cost $320 a year at $50 a hp a year. The cost of Cling-Surface, for the whole plant, was $31.50 a year. [See photograph, page 53.]

Storm

After that, a storm unroofed this building one night, and drenched the whole plant. The superintendent thought work was out of the question next morning. The loss of time was 20 minutes; thanks to Cling-Surface which made the belts waterproof, or rather water-resisting.

Shavings and dust

Another in same plant.—They had two planers in charge of nobody — everybody used them — belts covered with shavings and dust. The belts have been full of Cling-Surface more than six years, and are always clean; they cling to the pulleys; you can feel the cling as you draw your fingers across them, but the dust don't stick.

52 000

The Buffalo News bought a press last year, guaranteed to print 48,000 papers an hour. Weighed 90 tons. When hitched to the motor, it wouldn't budge; belt slipped; and the slipping burnt the belt. The char was scraped-off and Cling-Surface put-on. With two applications, it printed half the number agreed — that is, the belt still slipped, shirked half its work — with four applications, it printed 52,000 an hour: 4,000 more than agreed.

Buffalo Foundry Co had a 16-inch vertical canvas belt from main shaft to blower; which, drawn tight with an idler, slipped with load of 35 hp.

Bad for the belt business

Before buying new belt, they tried Cling-Surface on old one. The old belt is still in use.

Pan-American Co had an old belt in power-house; it was utterly dead. We took-off 15 lb of dirt and put-on 2 oz of Cling-Surface first application. Soon came to life and was good for 180 hp. After the Exposition, the dealer took it back, but in good condition.

Dead belt comes to life

Buffalo Street Railway Co uses Niagara power, but has a belted plant for emergencies. One night, in a snow-storm, at the time when theatres were letting-out, tracks deep in the snow, Niagara suddenly stopped — slush ice in the intake.

Helps-out Niagara power

The belts had been idle for weeks; they took-up the work in an instant; and all, but one, ran slack and silent; that one was tight and fairly shrieked. The quiet belts were full of Cling-Suface; the noisy one was not.

Gorham Mfg Co, Providence, R I.—We think very highly of it.

So do we

Atlantic Rice Mills Co, Beaumont, Texas.—Keeps belts in condition during our idle time.

Shut-down

American Linseed Oil Works at Buffalo had a 5-inch dynamo belt with one side stretched so that only half of it touched the pulley. Put-on Cling-Surface; of course, it carried its load; but, when the leather gets stuffed full of Cling-Surface, that belt will get back to its proper flatness, and be as good as a new one. Engineer Terry knows about it.

Its least advantage

Dearborn Power Co, 329 Dearborn St, Chicago.—Being skeptical as to putting anything on belts, it was some time before I tried Cling-Surface, and then I was driven to it. Our power was short and belts showing signs of rapid deterioration. With Cling-Surface, tight belts became slack, and carried their load without the least difficulty; and the belts are soft and show a fine glossy clinging surface. It was a complete revelation to me.—Chas L Hart, Chief Engineer.

Complete revelation

Canadian Rand Drill Co, Sherbrooke, Quebec.—Have used Cling-Surface on rubber driving belt with 20-inch sag; not taken-up for a year-and-a-half. Belt in good condition.—A Sangster, Supt. See photograph, page 62.

Rubber

Cotton belts

Rice & Adams, Buffalo.—We have been using Cling-Surface three months, and only regret we didn't know it years ago.

Largest in Sydney

Standard Brewery, J T & J Toohey Limited, Sydney, New South Wales, Australia.—We have no longer the worry and anxiety of tightening belts. We run them as slack as we please; and the increase in power is remarkable. Saves bearings and belting. M M Cann, Engineer in charge.

Stitched canvas

Attica Brick and Tile Co, Attica, N Y.—We use Cling-Surface on all belts — stitched canvas. Our men seem to think it a cure for every machinery ill, and are very liberal with it.

Excellent

Caxton Building Co, Cleveland.—Engineer says "pay the bill quick."

No real trouble

State Agricultural College, Military Dept, Lake City, Fla.—Had lots of trouble with leather belts and were about to replace them with larger. Cling-Surface stopped it two years ago; and the belts are in prime condition. Our only trouble now is with rubber: it tears-off the face of the rubber and leaves it in lumps on the pulleys.

[Scrape it all off; the belt is better without it. See Chapter XXX page 31.]

Makes 'em good.

Toledo Polytechnic School, O.—Had a lot of old belts, that frequently broke. Now they run slack, are good for years; and fuel is less.

Help

C F Jackson Co, Norwalk, O.—Conditions hard; no trouble; slack belts. It is great stuff.

Charm

Robbins & Myers Co, Springfield, O.—Works like a charm.

Don't have to

Buckeye Roller Mills, Salem, O.—Don't see how we got-along without it.

Enough

Hall & Co, Manayunk, Philadelphia.—Satisfaction all through our plant.

What more

H K Porter Co, Pittsburgh.—Entirely satisfactory.

Time and money

Albert J Thompson, Wycombe, Pa.—It has already saved us time and money. My machinery moves with a twentieth-century hustle.

A third

Specialty Woodworking Co, Philadelphia.—We believe it has increased the efficiency of some of our machines one-third.

A quarter

H S Rohrer, Strasburg, Pa.—Our belts pull fully a quarter more than before we used Cling-Surface.

Four years

Iron City Tool Works Limited, Pittsburgh.—Have used it four years, and run belts slack.

Hot cool

American Woodworking Machinery Co, Williamsport, Pa.—Pulleys formerly hot, are now cool.

Thanks

Pittsburgh City Home and Hospital, Boyce, Pa.—The days of tight belts are over, so far as I am concerned.—A K Young, Chief Engineer.

Any old belt

E & B Holmes Mach. Co, Buffalo.—Any old belt with Cling-Surface is better than any new belt without it. We have used it five years; and our belts are soft elastic flexible well preserved.

A quarter

Standard Hosiery Co, Philadelphia.—We had great trouble with belts; now none. Our belts are slack, and the gain in power is 25 per cent at least.

More

Tennessee Woolen Mills, McMinville, Tenn.—$10-worth saves us $100.

A third

Jefferson Medical College, Philadelphia.—A 12-inch belt, with 24-inch sag, is doing 60 hp; without Cling-Surface it would only do 45 hp. Gain of one-third in power. An 8-inch belt, with 20-inch sag, is doing 35 hp.

True

American Machine and Foundry Co, Kingston, Pa.—The only thing on earth that will keep a loose belt from slipping, and preserve the life of belts.

Building saved

Zeis Brothers, Buffalo planing-mill, putting-in new engine 250 hp, room too small, 24-ft centers; engine-builder wanted room to extend the centers 10 or 12 ft. Zeis said they'd get the power with Cling-Surface. Did. [See photograph, page 59.]

Immense relief

H-O Mills, Buffalo, 24-inch main belt, 24-ft centers, 265 hp, 4700 ft a minute, 600-lb idler; and nothing but trouble for years. No belt-dressing held for more than six hours; had tried twelve.

With Cling-Surface, no trouble at all. Have added 25 hp to the load, and run day and night sometimes for a month without stopping, no idler.

Without it, power was short, engineer was afraid to leave his post for a minute, no Sunday.

With it, complete relief and power to spare for a year now.

Rubber and rope four years

Flierl & Reimann, Buffalo.—Four-years use of Cling-Surface on rope and rubber. Ropes are round and smooth, greatest possible contact, no slipping, waterproof; rubber in perfect condition. Results could not be better.

Feed faster cut deeper

Wellington Machine Co, Wellington, O.—We use it on all belts, and have increased the output of some of the machinery over 25 per cent. In case of one lathe, it used to require 4 hours to turn and finish a fly-wheel; now 2¾. The reason is we feed faster and cut deeper.

They buy by the bbl

Pressed Steel Car Co, Allegheny, Pa.—Have found it superior, both in economy and quality.—W H Cox, Master Mechanic.

Old one good enough

Akron Smoking Pipe Co, Mogadore, O.—We have a 16-inch belt, had bought pulleys for a 24-inch belt, intended to buy the belt; but, after using Cling-Surface, found it unnecessary. The 16-inch belt is doing one-third more work than formerly.—C Fenton, V President.

Big mill

Camp & Hinton, Lumberton, Miss.—We had a 48-inch leather belt and several 24-inch leather and rubber belts, which were slipping a great deal; used several dressings to no advantage. Got 100 lb Cling-Surface; and, since, the idlers are raised and no slip at all.—J P Greenwood, Chief Engineer.

They would if they could

A O Benjamin, Chief Engineer, Greenville, Pa.—When I want more power I slacken my belts. If I were a belt manufacturer, I'd fill my belts with Cling-Surface before I let them go-out; and I am sure I could clean-up the trade. [You couldn't fill them unless belts were in motion.]

Conservative

University of Vermont and State Agricultural College, Burlington.—Have given Cling-Surface a pretty thorough trial on two belts. They are improved in softness and pliability. One will carry more load; the other is never overloaded.—A W Ayer, Professor of Mechanical Engineering.

Canvas

Richmond Underwear Co, Richmond, Vt.—Works to perfection on new leather and old canvas belts.

It is the only one

E B Eddy Co Limited, Hull, Canada.—Our General Mechanical Superintendent says Cling-Surface is the best preparation for keeping belts from slipping.—W H Bailey, Sec and Treas.

Austria

Neuhaus & Pauer, Girs-Conto bei der Landerbank, Vienna, Austria.—We are so pleased with Cling-Surface, in our own works, that we should like to arrange for the sale of it in Austria.

Half-way round the world

New South Wales Government Railway, Offices of the Railway Commissioners, Sydney.—Trial of Cling-Surface shows good results.

T J Knott & Son, Carbon, Iowa.—We had a very troublesome belt. With Cling-Surface, it runs slack without slipping; and every machine connected with it runs positive.

Flour-mill

Millbury Electric Co, Mass.—A belt, that we had to run as tight as possible, sags a foot and a half.

Of course

Whitehall Electric Light Plant, Mich.—One belt is too crooked to run with more than 6-inch sag; before Cling-Surface, could hardly keep it on with a heavy load.

Crooked belt

Doll Furniture House, Buffalo; Wm Blozier, Engineer. —Been using Cling-Surface on elevator belts for years; when, one morning, belt slipped; and the doctor was sent for — belt doctor — our man. He found them smeared with oil. Engineer examined his oilcan; empty. A man, discharged last night, had emptied it on his belts. There's never any trouble with Cling-Surface without some cause.

There's always a reason

Office Bank and Library Co, Boston, Mass.—Slack belts do better work. Material saving in power and wear.

Good

Hubert E Collins, Expert Engineer, Astoria, New York, was called in by M C Migel & Co's silk-mill. Engine could not carry its load; speed was down; another boiler thought-of. Worst feature was tight belts. Applied Cling-Surface; new boiler not needed; got the power by reducing friction. Exactly half the power had gone into friction; with Cling-Surface, 28 per cent. Not only saved 22 per cent of the power, but saved the wear 22 per cent of the power was making — besides the boiler.

Good tale

22 per cent and the boiler

Henry Floy, Consulting Engineer, 220 Broadway, New York, has used Cling-Surface three years in his practice, and always the same result: suppression of belt and friction troubles, improvement of belts, and saving of power.

The whole thing

Mississippi Furniture Mfg Co, Vicksburg, Miss.— Wouldn't like to be without it.

Furniture worker

Lyndhurst Mills, Lyndhurst, N J.—Our material (pumice garnet and emery) makes us trouble from dust. Cling-Surface stops all trouble.

Emery-dust

Whitman Mfg Co, Garwood, N J.—We use very little of it ourselves, but tell others about it and give them a little to try.

Good customer

H Grieshaber & Sons, 77 Clinton St, Newark, N J.— A quarter-turn belt would slip till we got Cling-Surface; not a bit now.

Quarter-turn

Go by the book

La Clede Hotel, St Louis, Ernest Poltner, Engineer.—After having long trouble with two dynamo belts, I tried Cling-Surface, without relief. Your salesman applied it; and then the relief was complete; I had paid no attention to instructions.

Elevator dropped

Blakesley Saddlery Store, 173 Ellicott Street, Buffalo.—Before we had Cling-Surface, our elevator dropped from third floor to basement with 3000 lb of leather; belt slipped. Now carry more, and easily. We advise the use of it, whether belts slip or not. The longer we use it, the softer the belts are; but they never slip.

Well said

Albany Perforated Wrapping Paper Co.—Tight belts are no longer required. Our slack belts drive perfectly, with none of the annoyances unavoidable under the old system.

Several days under water

H A Lancaster, South Sterling, Pa.—The belts, after being under water sawdust and sand for several days, were a tough-looking lot; but, after scraping-off the sand and applying Cling-Surface, they did more work than before. The belt follows the pulley half way down to the level of the shaft. Cling-Surface saved us $80 worth of belts in that flood.

Added a saw-mill

With 10-cents-worth a day, on a belt that had always made trouble before, we have added a saw-mill cutting 10-m ft of maple or other hardwood a day.

But we have one belt that Cling-Surface does not work well with: a new 12-inch three-ply rubber. [You put-on too much.]

Good enough

Fraser & Chalmers, Chicago.—The best commendation we can make of Cling-Surface is: we are sending you two more orders for 50 lb each.

5 per cent on big power is a lot

Dominion Motor and Machine Co Limited, Toronto.—Besides stopping all slip of our belts, we find a saving of at least 5 to 10 per cent on our power.—E J Philip, Vice-President.

Six months

Frost Wire Fence Co, Welland, Ont.—Been using Cling-Surface six months, and have hardly had to take up one belt.

Rubber

Ireland National Food Co Limited, Toronto.—We are particularly pleased with Cling-Surface on 18-inch 5-ply rubber driving-belt, which has been in constant use for ten years, and has generally required a tightener; not with Cling-Surface.

N Wenger & Brothers, Ayton, Ont.—We have used Cling-Surface long enough to think it worth paying for; cheque enclosed.

Thanks

Robert Taylor Co Limited, Halifax, Nova Scotia.—We have been obliged to take nine or ten inches out of the 5-inch belt, not because of slipping, but because it became dangerous to persons passing under it [slack is below]; it still did its work. Before using Cling-Surface on this belt we had to have it so tight as to be continually breaking and to require two or three men to put it on the pulley.

Too slack

O McHenry Seeded Raisin Co, Modesto, Cal.—Am using Cling-Surface on 2000 ft of belting. Some of my belts are so slack as to touch the bottom half.—P W Christenson.

Don't let 'em drag

Nugget Group Mining and Milling Co, Rowena, Col.—I wouldn't run a mill without Cling-Surface. Less fuel, less wear and tear, and more ore crushed, is what it does. —R G Humingway, Foreman.

More ore crushed

W H Wakeman, engineer and author, New Haven, Conn.—An old belt, so soaked with oil that it was useless, after being washed with benzine, and treated with Cling-Surface, is doing good work.

Oily belts

G A Hawkins & Sons, Mansfield Center, Conn.—Cling-Surface has increased our power 25 per cent, besides saving the time and trouble of tightening belts.

25 per cent

Totoket Mills, Versailles, Conn.—A series of counter belts, transmitting power to another building, were somewhat overloaded; and, having to add 25 per cent to the load, I intended to put in wider pulleys; but, first, tried Cling-Surface on the belts on the old ones.

25 per cent

I then put-on the additional load, without changing pulleys or belts; there is now less slip than there was before with the lighter load.

Have used it three or four months, and find that the belts are never sticky, but have a clinging quality, like that of rubber.—D Wright, Superintendent.

Krebs Pigment and Chemical Co, Wilmington, Del.—The first we put it on was an elevator belt, that had been giving a good deal of trouble. That belt now lifts about twice as much as before.

100 per cent

Corby's Modern Bakery, Washington, D C.—We are transmitting power that we couldn't transmit without Cling-Surface. We had some old belts that we were

More power with old belts

going to throw-away; but, with Cling-Surface, they worked better than when they were new. Our conditions are rather hard: high temperature and flour dust. They seem in no way to hinder. Without Cling-Surface, we should have to widen pulleys and belts a good deal.

40 hp

Georgia School of Technology, Atlanta, Ga.—We are transmitting 40 hp with a single 9-inch belt; which couldn't be done without Cling-Surface.

He thinks 25 per cent

Farmer's Mill and Gin Co, Harmony Grove, Ga.—We have had no hot boxes since using Cling-Surface; and the gain in power, I think, is 25 per cent.

One-third

Selden Cypress Door Co, Palatka, Fla.—We have to-day applied Cling-Surface to several belts; have one very trying belt on a blower. One touch of Cling-Surface seems to have entirely stopped its slipping, and to have added a third to the blower's efficiency.

Old rubber belts

Quincy Water Works, Quincy, Ill.—We are surprised at the improvement in service. The rubber of our old belts had been worn off; but Cling-Surface makes them as good as new, if not better. We get more power with slack belts than before with tight.—Dow R Guinn, Supt.

Always

Oakland Electric Light, Oakland, Ill.—Cling-Surface pays in my coal pile.

No idler

Geneva Milling Co, Geneva, Ind.—Our mill is running with the heavy idler off, with a 4-ft sag in the belt, no slip, and 60 hp.

Very instructive

U S Arsenal, Frankfort, Philadelphia, Osmond M Lissak, Ordnance Department, U S A, and Thomas T Taylor, Post Electrician.—Test shows that Cling-Surface increases the power of belts, that belts can be run slacker, and do the same work.

Before applying Cling-Surface, moved the dynamos toward the shaft until the belt began to slip; it then sagged 5¼ inches from position when tight — without Cling-Surface. [The drive was above and the slack below.]

Put-on Cling-Surface, moved the dynamo nearer shaft till the belt began to slip at 10½ inches sag and dragging heavily on the floor — with Cling-Surface.

Current constant during test.

[It was the drag on the floor that made it slip; not the slack; no amount of sag would make a belt slip; the slip was from easing the weight of the slack of the belt on the pulley — the drag on the floor.

Big help

Federal Oil Co, Warren, Ind.—It helps our belts 100 per cent. I can't run them slack, as there is a terrible back-lash on belts running oil-wells on a beam; but I can run them easy; and they don't slip.—Chas Van Sickel.

Southern Cotton Oil Co, New Orleans.—Been using Cling-Surface a year in mill at Gretna, La; and the belts are working so slack that we know the friction is much reduced. We are satisfied that we are making a saving by the use of it. Cotton-seed oil

Chestnut Coal Co, Chestnut, Montana.—About the only trouble we had was from frost on our belts at night; it took an hour of hard work to get them in working order. Cling-Surface ended that. Water-resisting

A Weiskittel & Son, Baltimore.—It increases output and diminishes trouble. True

Hoyt Brothers, Ware, Mass.—Our work is all outdoors; dirt water snow ice on the belts. Cling-Surface saves us much time. Water-resisting

Mississippi Cotton Oil Co, Grenada, Miss.—After breaking three shafts on the crusher with tight belts, we tried Cling-Surface. No more trouble: same load with slack belts. Tight belts broke shafts

C A McKenney, Winterport, Maine.—After getting my belts well filled with Cling-Surface, I find I have been losing about one-fourth of my power. Am grinding one-third more meal. One-third more meal

Newport News Pumping Station, Va.—If I had had Cling-Surface a year ago, it would have saved the city $150 on belts; as belts became rotten in this plant in a short time from dampness, and then burst or jump-off. —E L Gentis, Chief Engineer. Water-resisting

Henry A Hare, Richmond, Va.—Up to the time of using Cling-Surface, I was worried a great deal. Since then have not had a bit of trouble, and have had a remarkable increase of power. No more worrying

Wilke Mfg Co, Anderson, Ind.—It would be height of extravagance to be without it. Extravagance

Hollingsworth & Whitney Co, Waterville, Maine.—We no longer have to shut-down to take-up belts; as we don't have to strain and pull them to pieces, to get them to do the work. One view of it

Joseph E Know & Co, Lynn, Mass.—To drive our 7-ft Idlers needless grind-stones, had always used idlers. With Cling-Surface, belts sag so low the idlers don't touch 'em.

They needed it

S Peabody & Son, Haddam, Kansas.—Have trebled capacity with Cling-Surface; can't get-along without it. In small plants, where centers have to be short for want of room, it pays for itself the first day.

New building saved

Fitchburg and Suburban Street Railway Co, Leominster, Mass.—We have some of the worst grades in the country, the power is sometimes all on, and sometimes all off. We have two 400-hp generators 19-ft centers. Engineers thought it impossible to run on these centers, and the Co decided to enlarge the building. I agreed to run the plant on these centers without slip or extra strain on the bearings, with Cling-Surface; have used it for years, and find that the worst cases of strain and slip can be cured.

Short centers

Of course

Hughes Gold Mine, Fork Union, Va.—Cling-Surface does wonderful work in the matter of journal friction.—Wm Bugbee, Manager.

Saturday-night load

Electric Light Plant, Morgantown, W Va.—But for Cling-Surface I couldn't haul the load I have these nights. —J Wm Jones, Engineer.

May last ten years yet

Canton Tile Hollow Brick Co, New Bethlehem, Pa.—Bought three belts for one machine last year; two were worn-out and the third was in such bad condition that we were about to buy a fourth; but tried Cling-Surface.

Our trouble was: the belts would slip, though pulled very tight by a tightner; they would slip and tear.

We now run with slack belts and have no slip. If we had used Cling-Surface on all belts a year ago, it would have saved us $100. Have tried everything.

Holland

Ant Jurgens, Osch, Holland.—We send you a second order. Please inform us where we can get it in Europe; to save time.

Holland

Firma A F Smulders, Machinefabrick, Schwupswerf, Rotterdam, Holland.—We can but express our greatest satisfaction with Cling-Surface.

Hawaii

Hilo Elec Lt Co, Hawaii.—Cling-Surface does all you state for it as to the working of belts; we trust that your statement, as to its effect on belts, will be equally well established.

Mexico

Dwight Furness Co, Guanajuato, Mexico.—We have a very high opinion of Cling-Surface.

Mexico

E J Canas, Cuernavaca, Mexico.—Cling-Surface has enabled us to do more work in less time for a year now.

Serrano V Farjas, Empresa de Luz Electrica, Torreon, Mexico.—It is what we were looking-for; please hurry it forward by express.—Phil Head, Electrician.

Mexico

W T Gage & Co Limited, Toronto, Ont.—It has increased the speed of our machines over ten per cent.—Wm J Wiken, Engineer.

10 per cent speed in printing

Peiffer & Co., 200 Academy St, Newark, N J.—The only thing that puzzles me is: how you can make any money on it, when a 25-lb can lasts two years.

[If you use it only on troublesome belts, you are losing money on Cling-Surface as well as making it. For all belts.]

Our time is coming

Atlantic City Railway Co, trying to run an overloaded booster, it wouldn't turn. Put-on Cling-Surface; no trouble since; would do more.

Booster

Passaic Beef Co, Passaic, N J.—They do more work, running slack, than we could get out of them under high tension.

More work and easy

Porter Mills (E J Hender, Lessee) Hillsboro, Sierra Co, New Mexico.—It has proved itself worth its weight in gold. Our belts are old rubber, slack side below; and the mill is a perfect cloud of dust from this ore. Cling-Surface has added 15 per cent to the power.

Ore-dust

American Can Co, Brooklyn, N Y.—If used according to instructions, it can be relied-on.—James M Mungiven, Manager.

Relied-on

Franklin Mills, Lockport, N Y.—Best thing we know.

High praise

H C Harrison, M & M E, Cerraboo, Mexico.—Had all belts painted with it, just as little as could be put-on, and let dry for five days. Results are: the blower belts give splendid results, belts slack and no hot boxes. But the main driving rock-breaker and sampling belts are not satisfactory; they do not slip, but they catch all the dust and form lumps on pulleys and belts. Have had to clean them twice in 15 days. I am well satisfied with it, for belts that can be kept free from dust; but shall never use it again on outside belts that can catch dust.

[You put-on ten times too much. It is surprising that you had any good results at all.]

Mexico

F E Conley Stone Co, Utica, N Y.—We are using Cling-Surface on belts at two of our stone-crushing plants. It is giving great satisfaction.

Hard work easy

Four sorts of belts

Hind & Harrison Plush Co, Clark Mills, N Y.—Satisfactory. Used it three years on leather cotton rope and rubber; equally good on all.

Linotypes

Wesley B Stark, 30 Beekman St, New York.—I consider Cling-Surface indispensable to a plant of Linotypes. Transposition of letters is almost always due to slipping of belt.

Cotton-mill

Grosvenor-Dale Co, North Grosvenor-Dale, Ct.—Using Cling-Surface over a year. Best clinging properties of anything we ever used and seen nothing injurious. Are extending its use.—F M Messenger, Agent.

Brick-dust

Alfred Hunter & Son, Albany, N Y.—We had to keep belts extremely tight; even then they slipped. Been using Cling-Surface a year, with slack belts. No slip, quite a saving in fuel, belts in perfect condition and waterproof.

Trouble stopped

Hibbard Brothers, Sandy Hill, N Y.—We had to run it as tight as possible, then had trouble. After two coats of Cling-Surface, trouble stopped.

Enough

Oneida Community Limited, Kenwood, NY.—Working well.

Wall-paper

Standard Wall Paper Co, Sandy Hill, N Y.—It is the only thing we ever tried that came-up to representations. —J Jackson, President.

Infernal hold

Diamond Mills Paper Co, 44 Murray St, New York.—Have been afraid to go it too heavy on rubber belts; for it takes such an infernal hold, we thought there might be trouble. [Go it light on rubber; but not for that reason.]

Camel's-hair

Genesee Paper Co, Rochester, N Y.—Belts, mostly camel's-hair, run slack and true as a ribbon.

Too much

Daniel Griffiths & Son, Utica, N Y.—Had we better shorten a very loose belt that flaps from side to side? It makes a good deal of noise. We put the Cling-Surface on as thin as possible; but it was cold in the shop, and it chilled as soon as it touched the belt; we couldn't spread a brushful more than 8 or 10 inches. When we began to run, it came-off and stuck to the pulleys, but seems to be working-off and probably into the belt. However, it works all right; and we get the full power, which we never got before.

[Evidently you put it on a still belt; it should have been running. You also put on ten times too much. See Directions, Chapter XXX.]

Hard work easy

Adelphi Hand Laundry, 237 De Kalb Avenue, Brooklyn.—My narrow belts, which have had to be strained to the utmost, are now easy, and do not slip in the least. I don't know how I got-on so long without it.

Every way good

Floy & Carpenter, Consulting engineers, 220 Broadway, New York.—We have used Cling-Surface two years, ever since we made the exhaustive tests which proved that it was profitable. We have used it in many plants, with which we have been connected; and the results have always been clear. We have always transmitted the same or greater power with the slack belt, where before it had been necessary to strain both belts and shafts. Besides, it does not impair the strength of a belt, but improves it.

No slip

New Paltz Electric Light Co, N Y.—It has solved the problem of slipping belts with us.

All belts

Waterville Laundry, Albany.—Find a vast difference in my driving belt. I shall have it on all my belts.

He knows

W A Kennedy, Italy Hill, N Y.—It gets into the belt, and stays there. My iron pulleys have lost their nickel-plate look, and my wood pulleys have a dead finish that means business.

So does he

John F Brady & Co, Cooperstown, N Y.—Keeps leather in good condition and greatly increases the power.

Cheap

Wm H Townsend Jr, Milton, N Y.—It takes very little to get all the power a belt can transmit.

A trial settles it

McKinney Mfg Co, Allegheny, Pa.—Given Cling-Surface a thorough trial and find it very satisfactory.

Less coal no trouble

Morris & Co, Baltimore.—Before we got Cling-Surface, we had a great deal of trouble with our belts. Now none whatever; besides, our fuel-consumption has lessened perceptibly.

Oily belts

Union Printing Co, 15 Vandewater St, New York.—Works well on our old greasy belts.

Rope

George N Pierce Co's Pan-American Exhibit, Buffalo.—In a trying case, we wore-out a new rope in two days. Cling-Surface let us out of the difficulty. After four applications, there wasn't a sign of distress.

Thanks

Otis Elevator Co, 71 Broadway, New York; works at Yonkers, N Y.—Satisfactory.

Kept our word

Wilmington Street Railway Co, N C.—It has done all you promised for it.

Two years

Diamond Match Co, Barberton, O.—Have used it two years. Well satisfied. Belts are soft and elastic.

Found how to use it

J F Smith, Bloomdale, O.—I had no trouble after I found how to use it.

Eloquent

Cuyahoga Steel & Wire Co, Cuyahoga Falls, O.—Giving entire satisfaction.

Emery-dust

Sterling Emery Wheel Co, Tiffin, O.—Have never seen or heard-of anything like it.

Always

Christy Knife Co, Fremont, O.—Every way satisfactory.

Victory

W H Boyd & Brother, Mt Victory, O.—Thank you for clinging to us till we tried it. [It took 10 letters to get 'em to use it right.]

Absolute proof

Now we come to the surest single item of proof we have; for it is the judgment of learning as high as any, judging from exhaustive tests.

For ease of reading, we put Professor Carpenter's statement in our own language, omitting all but the most significant part, and print it with his approbation. For Carpenter's full report, see Sibley College Journal of Engineering, December, 1899.

Department of Experimental Engineering, Sibley College Cornell University, Ithaca, N Y. Professor R C Carpenter.

Digest of Carpenter's statement

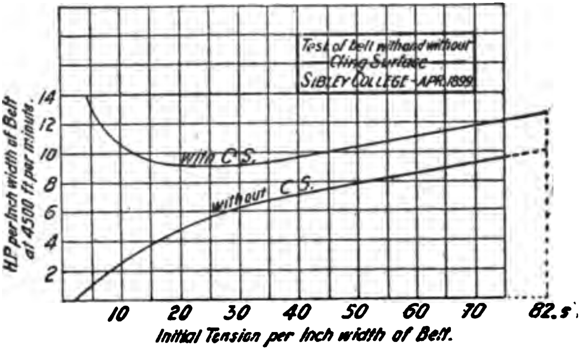
Tests made on the college belt-testing machine, which gives, under usual working conditions: the power supplied, the power delivered, the tension, contact, and slip. Three belts tested, each before and after treating with Cling-Surface, and each under various loads. Over 50 tests; some repeated to check accuracy. The belts, before testing, were in good condition and running under

Digest of Carpenter's statement

rather better than average conditions. Cling-Surface applied as directed.

In the diagram, horizontal distances show the initial tension of belts in lb per inch of width [initial tension means tension before they begin to work]; the vertical distances show the hp delivered per inch of width of belt for a speed of 4,500 ft per minute.

The lower curve represents the results without Cling-Surface; the upper curve the results with Cling-Surface.



Digest of Carpenter's statement

Without it, the law is: the tighter the belt, the greater the power. With it, the law is less simple; extraordinary power is got with very slack belts; but, if for any reason, you have to use so much as 35-lb tension per inch of width, you will get more power with increase of tension.

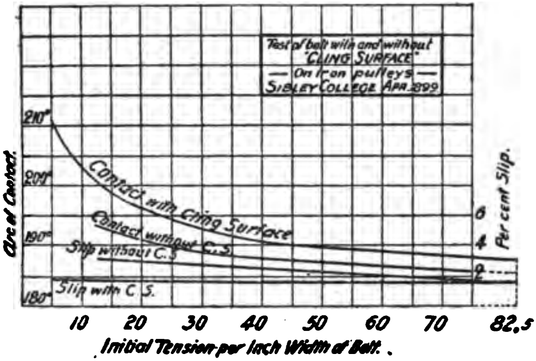
But, since there is no longer the old occasion for having belts tight, the old rule is reversed; and the practical rule now is: The slacker your belt, the greater your power.

Digest of Carpenter's statement

At all tensions, the Cling-Surface belt delivers more power than the non-Cling-Surface belt.

The most extreme instance shown in the test is this: At 5-lb tension [the slackest possible, only the weight of the belt] the belts, with Cling-Surface, delivered 40 per cent more power than, without Cling-Surface, at 80-lb tension; and 15 times as much as, without Cling-Surface, at equal tension.

Cling-Surface seems to be an excellent preservative of leather, so far as three-years acquaintance with it shows.

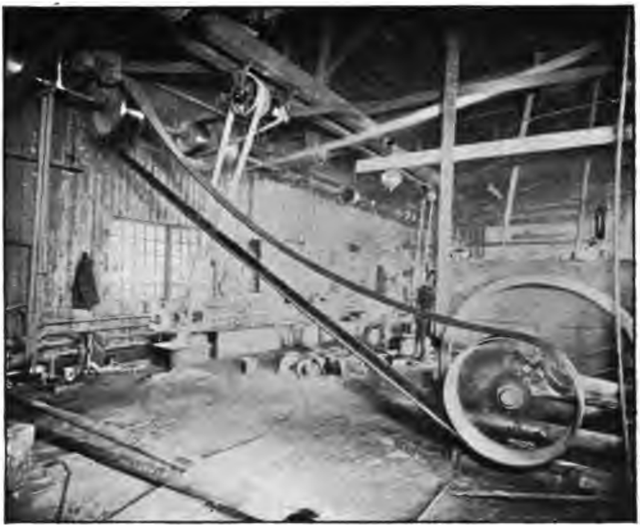


PART VI

XXXIV CLING-SURFACE PHOTOGRAPHS

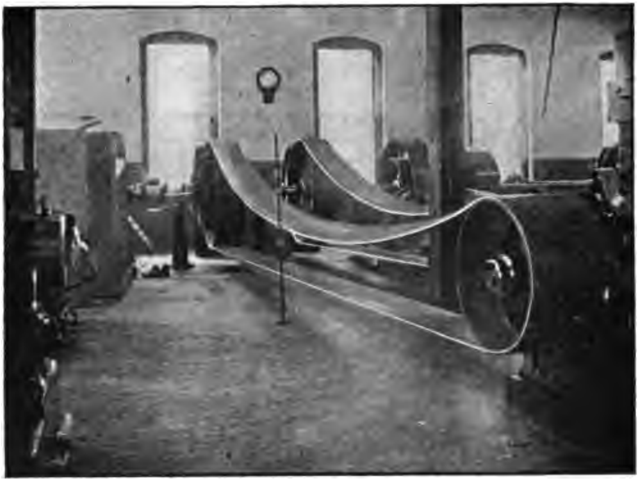
Seeing is believing. Here are belts in motion; slack under full load; and pulling more than tight belts can pull.

What photography can't show is: how much more power a slack belt has; that the extra power is saved from friction; belt economy; no belt troubles; no friction troubles; machine economy; less repairs; less loss of shop time; mill economy; increase of product; dust-proof water-resisting waterproof belts; relief from anxiety; how much each of these items amounts-to; the total of all; the cost and value; net gain.



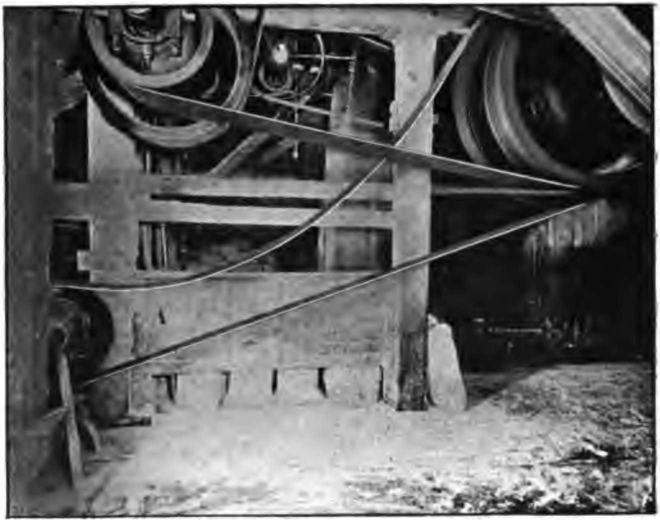
This was the first demonstration of slacking a belt to get more power. Erie RR Union Dry Dock Co, Buffalo.

Before March '96, it had been run tight. Cling-Surface was then applied, and earned in two years (besides exemption from trouble) $640 in extra work. See page 34.



Five minutes after the photo was taken, the belts sagged 31 inches—the bigger the load, the slacker the belt. The load jumps, sometimes in an instant, from zero to full. No slip; I think the belts would pull apart before they would slip.

Rockland Thomaston and Camden Street Railway, Rockland, Maine, L C Jackson, Chief Engineer.

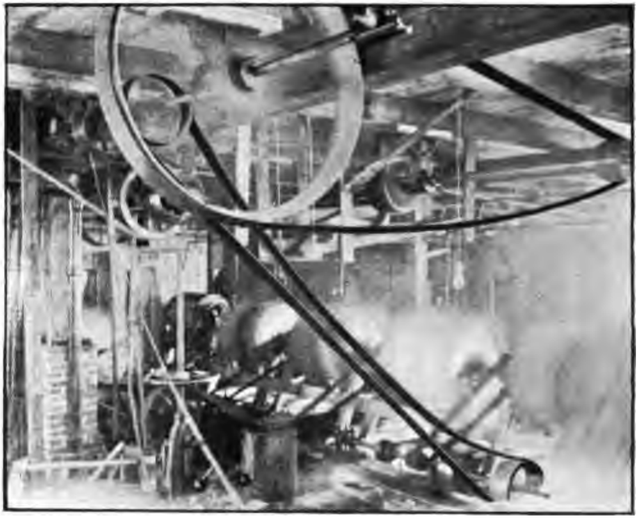


The slack belt is doing 80 hp, uneven load. Cling-Surface is being applied all through the mill, and the belts being slackened. Results, so far: more work, no trouble, not even from dust—dust does not stick to the belts at all.

Reliance Mill, Providence R I

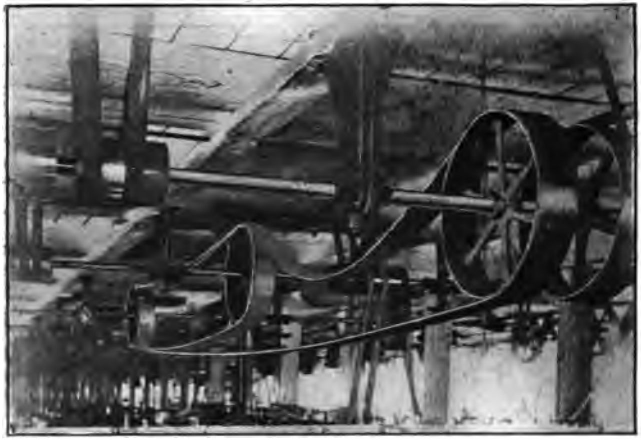
This belt was as tight as a fiddle-string, and hot box was a frequent occurrence, before Cling-Surface; now easy and no trouble.

Home Electric Light and Power Co, Elkhart, Ind., A M Barron, General Manager.



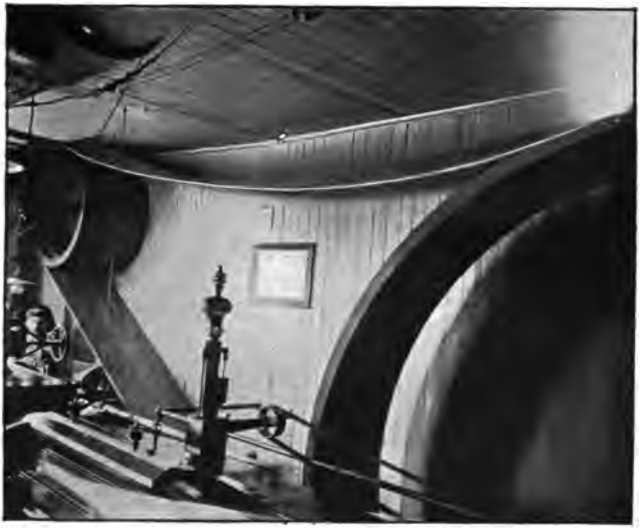
The belt, whose slack is almost rubbing against the working side, has more wrap and so gains power from being slack; it is doing an enormous amount of work. The other, with slack underneath, has less wrap, and so loses power from being slack. No harm; there's power to spare.

W M Farwell & Co, Northboro, Mass.



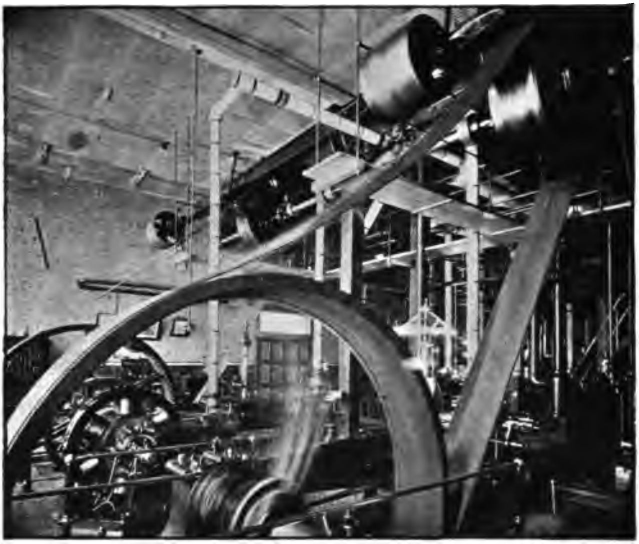
These belts couldn't carry their load, without Cling-Surface; because, the shafting being too light to stand the strain, the belts could not be tightened enough to keep them from slipping. With Cling-Surface, no strain.

The photograph is from Hope Mills, Hope Mills, N C.



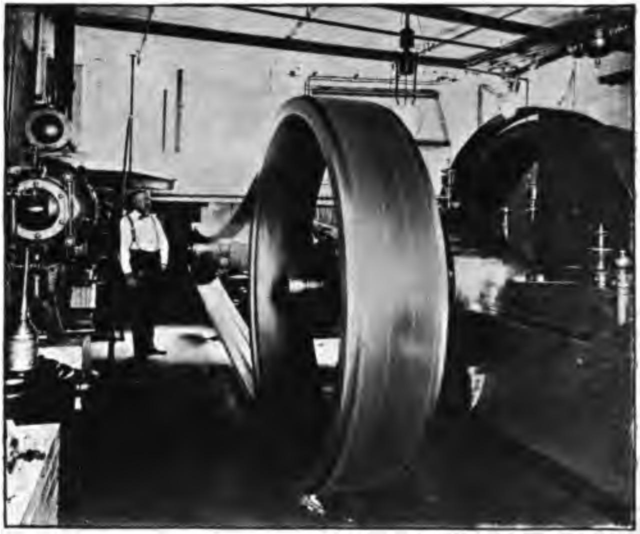
This is the belt that the engine-builder thought wouldn't run with so short centers (24 ft) as the room compelled; but it ran with ease and 20-inch sag; 250 hp. See page 37.

Zeis Brothers, Buffalo, N Y.



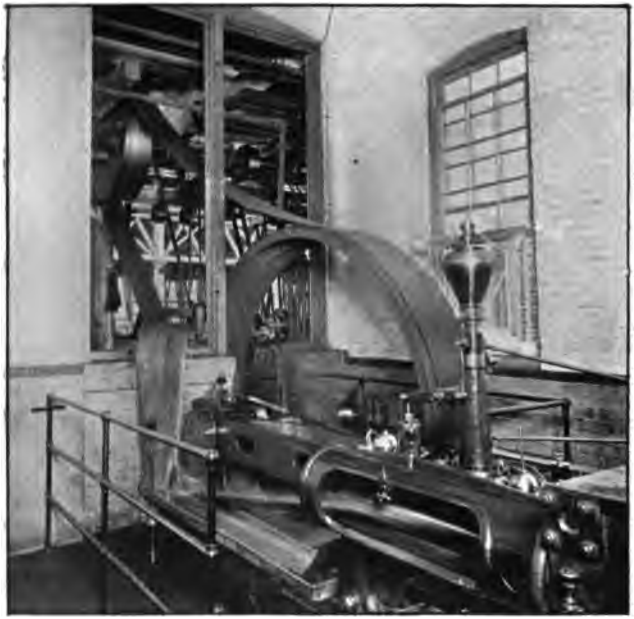
Formerly had to use idler to carry full load; with Cling-Surface, no difficulty, no idler.

Lion Brewery, Buffalo, Oscar P Rochevot, Chief Engineer.



This shows how every dynamo belt in the world can be run, but don't show the consequences: no belt trouble, no friction trouble arising from pull of belt, a saving of power, a saving of wear.

It is from the plant of Brown Durrell & Co, Boston. E B Prescott, Chief Engineer.



This rubber belt has not been shortened in a year and a half. Cling-Surface keeps it in good condition. See page 35.

Canadian Rand Drill Co, Sherbrooke, Quebec, A Sangster, Superintendent.

PART VII

XXXV SUMMING-UP THE NEW KNOWLEDGE

1) No more appreciable belt slip.

2) No more tight belts.

3) No more belt troubles.

4) No more friction troubles from tight belts.

5) Loss of power materially diminished.

6) Capacity of all works materially increased: more output.

7) Lost power turned from wear to work.

8) Repairs of machinery lessened materially.

9) Less loss of shop time — the principal item in cost of repairs.

10) Life of all machinery lengthened.

11) Attention to belts diminished.

12) Tightening belts reduced to near nothing.

13) Repairs of belts reduced to near nothing.

14) Belt costs reduced, perhaps to a third or quarter of usual costs.

15) Leather belts water-resisting; cotton waterproof.

16) Both better in every respect.

17) Rubber belts more efficient.

18) The facts all known to the technical schools.

19) Not any of them in technical books yet: the knowledge is only six years old.

20) Known to those businessmen engineers and machinists, to whose attention Cling-Surface has happened to come.

21) Denied by nobody; undeniable.

22) Grant no more appreciable slip; the rest follow, one after another. Read them again, and see. All turns on the slip. That is not a difficult question. The book is full of proof; but you needn't rely on the judgment of others. Try it yourself; you can't resist your own experience; nobody has and nobody can. But is it so hard to accept a benefit?

23) It is new knowledge.

24) Is it worth your while to have the benefit of it while it is new?

25) The time is now.

26) Is it worth your while to have the full benefit of it?

27) Use Cling-Surface on all your belts, not on troublesome ones alone.

28) There is preventible friction from all, without it; though not enough, in most small belts, to make any outcry.

29) Cling-Surface is and does for belts what oil is and does for machinery.

30) You don't work a well-behaving machine without oil.

31) Don't work a well-behaving belt without Cling-Surface.

32) Mate Cling-Surface with oil.

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